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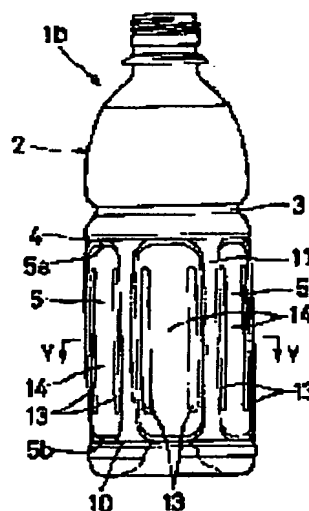
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## (54) BIAXIALLY ORIENTED BLOW-MOLDED CONTAINER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a biaxially oriented blow-molded container having an improved appearance and a reduced pressure reduction absorption panel by absorbing a deformation without lowering a strength with a small capacity.

**SOLUTION:** In this biaxially oriented blow-molded container, an annular groove 3 is formed on a peripheral wall 2, a plurality of pressure reduction absorption panels 5 are provided under the groove 3, protruding or recess longitudinal ribs 13 are formed at both side ends of the panels 5, and a wall surface 14 between the ribs 13 and 13 is bulged externally. Further, upper ends 5a of the panels 5 are formed substantially adjacent to lateral ribs 4 connected under the groove 3.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The biaxial-stretching-blow-molding container characterized by bulging outside the pillar section formed between said reduced pressure absorption panels in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall, and prepared two or more reduced pressure absorption panels in the lower part.

[Claim 2] The biaxial-stretching-blow-molding container according to claim 1 whose outermost edge of the part which said pillar section bulged is 2.5/1000 thru/or 17/1000 of die length. [ of a pillar section ]

[Claim 3] The biaxial-stretching-blow-molding container characterized by for the upper limit section of the reduced pressure absorption panel which connected the transverse rib under said circular-sulcus section, and was formed under this transverse rib in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall having adjoined said transverse rib substantially, and forming in it.

[Claim 4] The biaxial-stretching-blow-molding container characterized by having formed the concave or convex longitudinal rib in said reduced pressure absorption panel, and bulging the wall surface between these longitudinal ribs in the method of outside in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall, and prepared two or more reduced pressure absorption panels in the lower part.

[Claim 5] The biaxial-stretching-blow-molding container according to claim 4 which is the aggregate of two or more ribs which formed intermittently the longitudinal rib formed in said reduced pressure absorption panel.

[Claim 6] The upper limit section of said reduced pressure absorption panel is the biaxial-stretching-blow-molding container according to claim 4 which adjoined substantially the transverse rib connected under the circular-sulcus section, and was formed in it.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

**[Field of the Invention]** This invention relates to the biaxial-stretching-blow-molding container it was made to absorb deformation of the container produced with the reduced pressure accompanying cooling after being filled up with the fruit juice of a heating condition, oolong tea, etc. in consideration of structure or a location of a reduced pressure absorption panel etc. in more detail about a biaxial-stretching-blow-molding container.

**[0002]**

**[Description of the Prior Art]** Conventionally, the biaxial-stretching-blow-molding container of thermoplastic polyester, such as polyethylene terephthalate (PET), has the outstanding transparency and the outstanding surface gloss, has shock resistance, gas barrier nature, etc., and is widely used as a container of various bevel uses. The comparatively big round shape bottle of the capacity of 1.5 thru/or entering 2l. of this biaxial-stretching-blow-molding container is most, and said blow molding container is filled up with that operating condition, after it heats various drinks, such as fruit juice and oolong tea, before and after 90 degrees C, it carries out capping of the lid, seals it, and after cooling and returning to ordinary temperature again after that, it is shipped. When it expands after restoration seal and the inside of a bottle is decompressed after that at the time of cooling, in order to contract and transform this round shape bottle As shown in drawing 13, the circular-sulcus section b is formed in a peripheral wall a, and it is the die length L1 of the bottle drum section c to the lower part. Die length L2 which receives and occupies a big ratio While forming two or more reduced pressure absorption panels d which it has A pillar section e is constituted among these and contraction deformation is absorbed by these reduced pressure absorption panel d. Moreover, as the restoration approach of the above-mentioned drink, although an aseptic method also exists, after restoration and the inside of a container tend to be decompressed, and, as for oolong tea etc., the shaping container is absorbing contraction deformation similarly.

**[0003]**

**[Problem(s) to be Solved by the Invention]** Since the above-mentioned conventional biaxial-stretching-blow-molding container was the comparatively mass round shape bottle of 1.5 thru/or entering 2l., the contraction deformation by the reduced pressure at the time of cooling after restoration seal was absorbed by two or more reduced pressure absorption panels of the above-mentioned configuration, and it was satisfactory especially in the appearance on the appearance by deformation. However, while the need of a biaxial-stretching-blow-molding container with a small capacity, 200 [ i.e., ], thru/or a small capacity of about 900ml increased and the volume increased recently, deformation by the reduced pressure accompanying cooling after heat-sterilizing and expanding came to be conspicuous.

**[0004]** The reduced pressure absorption panel d deforms this deformation into a concave, especially the pillar section e of a straight configuration deforms into a concave, and appearance has the problem that fall remarkably and reinforcement moreover also falls. This has relatively few amounts of reduced pressure even if it is the biaxial-stretching-blow-molding container of the same structure, when it is large

capacity, after expanding after restoration seal, and to being absorbable enough, when the present reduced pressure absorption panel d deforms into a concave, when it is small capacity, the amount of reduced pressure becomes large relatively, and it is because it is unabsorbable by the present reduced pressure absorption panel d.

[0005] Therefore, since thickness of a container could not be made thin in order to raise the rigidity of a drum section, the container had to be fabricated using many ingredients. Moreover, if the die length of the shaft orientations of the reduced pressure absorption panel d is enlarged to the bottle drum section c in order to enlarge a reduced pressure absorbed amount, if this round shape bottle becomes small capacity, the tooth space on which the label for raising a display and commodity value of contents to the drum section of a round shape bottle is stuck will become small, and un-arranging will arise.

[0006] Then, the purpose of this invention is to be able to absorb deformation, without causing a fall on the strength, even if it is small capacity, and for appearance offer the biaxial-stretching-blow-molding container which fully secured the tooth space of label \*\*\*\* by supposing shaping that it is possible with the ingredient of a smaller amount, and moreover making the reduced pressure absorption panel small.

[0007]

[Means for Solving the Problem] It is characterized by proposing this invention in order to attain the above-mentioned purpose, and consisting of the following configuration. That is, according to this invention, in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall, and prepared two or more reduced pressure absorption panels in the lower part, the biaxial-stretching-blow-molding container characterized by bulging outside the pillar section formed between said reduced pressure absorption panels is offered.

[0008] Moreover, according to this invention, the above-mentioned biaxial-stretching-blow-molding container whose outermost edge of the part which said pillar section bulged is 2.5/1000 thru/or 17/1000 of die length is offered. [ of a pillar section ]

[0009] Moreover, according to this invention, in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall, a transverse rib is connected under said circular-sulcus section, and the biaxial-stretching-blow-molding container characterized by for the upper limit section of the reduced pressure absorption panel formed under this transverse rib having adjoined said transverse rib substantially, and forming in it is offered.

[0010] Moreover, according to this invention, in the biaxial-stretching-blow-molding container which formed the circular-sulcus section in the peripheral wall, and prepared two or more reduced pressure absorption panels in the lower part, a concave or convex longitudinal rib is formed in said reduced pressure absorption panel, and the biaxial-stretching-blow-molding container characterized by bulging the wall surface between these longitudinal ribs in the method of outside is offered.

[0011] Moreover, according to this invention, the above-mentioned biaxial-stretching-blow-molding container which is the aggregate of two or more ribs which formed intermittently the longitudinal rib formed in said reduced pressure absorption panel is offered.

[0012] Moreover, according to this invention, the above-mentioned biaxial-stretching-blow-molding container which the upper limit section of said reduced pressure absorption panel adjoined substantially the transverse rib connected under the circular-sulcus section, and formed in it is offered.

[0013]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained with reference to a drawing. This biaxial-stretching-blow-molding container 1a forms the circular-sulcus section 3 in a peripheral wall 2, forms two or more reduced pressure absorption panels 5 in that lower part, and bulges outside the pillar section 11 formed between this reduced pressure absorption panel 5, namely, forms [ in / drawing 1 and 2 show claim 1 and the gestalt of implementation of invention of two and / drawing ] the bulge section 12 of a convex configuration. When the amount of bulge of this bulge section 12 was 2.5/1000 thru/or 17/1000 of die length, it was confirmed experimentally that the purpose of this invention can be attained. [ of a pillar section 11 ]

[0014] In order to confirm the effectiveness by this bulge section 12, next, biaxial-stretching-blow-molding 500ml container 1a of a pillar section convex configuration, Namely, die-length:A=120mm of

the pillar section between the circular-sulcus section 3 and a step 6, die-length:  $B=105\text{mm}$  of a reduced pressure absorption panel, amount:  $C=\text{of bulge } 1.0\text{mm}$  of the bulge section 12 of a pillar section 11, width of face of a pillar section 11 :  $A \ D=9.0\text{mm}$  thing, For the comparison, the 500ml biaxial-stretching-blow-molding container of a pillar section straight configuration, i.e., the dimension of others [  $C=0\text{mm}$  ], examined by the same thing, and the result was shown in drawing 6 . According to drawing 6 , even if there are quite many amounts of suction by reduced pressure, whenever [ reduced pressure ] is falling and is understood that it has been hard that it comes to deform. Moreover, in observation by viewing, since what formed the bulge section 12 of a convex configuration in the pillar section 11 was the deformation which became [ whether a pillar section 11 becomes straight and ] a convex configuration, the deformation was hardly conspicuous.

[0015] Drawing 3 thru/or 5 show the gestalt of implementation of invention of claim 3, in drawing, a transverse rib 4 is connected under this circular-sulcus section 3, the circular-sulcus section 3 is formed in the peripheral wall 2 of this, and it forms [ upper limit section 5a of the reduced pressure absorption panel 5 formed under the transverse rib 4 adjoins a transverse rib 4 substantially, and ] the biaxial-stretching-blow-molding container 1 in it. Drawing 5 shows the X-X cross section of drawing 3 .

[0016] And the reduced pressure absorption panel 5 is formed in a concave, and a pillar section 11 is formed in between them. Since that upper limit section 5a adjoins the transverse rib 4 substantially, as a result, this reduced pressure absorption panel 5 produces deformation conventionally with the rigid improvement by the transverse rib 4 at the time of cooling after seal, and since the peripheral wall section formed above the reduced pressure absorption panel 5 which had affected deformation of a pillar section 11 does not exist, its deformation of a pillar section 11 decreases at the time of the above-mentioned cooling. In addition, since other transverse ribs 10 adjoin and are formed in lower limit section 5b of the reduced pressure absorption panel 5, it can say that it is the same as that of \*\*\*\*.

[0017] Moreover, according to above-mentioned effectiveness, as shown in drawing 3 , the die length of the shaft orientations of the reduced pressure absorption panel 5 became short, and since the large die length of the shaft orientations of the peripheral wall 2 which sticks a label was taken, the large tooth space which sticks the label for PR etc. on the biaxial-stretching-blow-molding container 1 could be taken.

[0018] Drawing 7 thru/or 10 show claim 4 and the gestalt of implementation of invention of six, and sets them to drawing. This biaxial-stretching-blow-molding container 1b Form the circular-sulcus section 3 in a peripheral wall 2, and two or more reduced pressure absorption panels 5 are formed in the lower part. The concave or convex longitudinal ribs 13 and 13 are formed in the both-sides edge of this reduced pressure absorption panel 5. The transverse rib 4 by which these longitudinal ribs 13 and the wall surface 14 between 13 were bulged, and upper limit section 5a of this reduced pressure absorption panel 5 connected [ method / of outside ] them under the circular-sulcus section 3 further is adjoined substantially, and it forms in it.

[0019] Although longitudinal ribs 13 and 13 show the concave thing in drawing, they may be convex. However, the thickness of the articulated section of a longitudinal rib 13 and a wall surface 14 becomes [ the direction of a concave ] thick, expansion of the above-mentioned longitudinal rib 13 after restoration seal is prevented, and fragmentation of the wall surface 14 of the reduced pressure absorption panel 5 at the time of reduced pressure and a pillar section is ensured, and deformation of the wall surface 14 at the time of reduced pressure deformation does not affect a pillar section 11, but can prevent deformation of a pillar section 11 certainly. Drawing 9 shows the Y-Y cross section of drawing 7 .

[0020] Next, in order to confirm the effectiveness by having bulged the wall surface 14 between this longitudinal rib 13 and these longitudinal ribs 13 in the method of outside Biaxial-stretching-blow-molding container 1b, i.e., amount:  $E=\text{of bulge } 0.5\text{mm}$  of a wall surface 14, amount:  $F=\text{of bulge } 0.3\text{mm}$  of a pillar section 11, radius of curvature of a wall surface 14 of 500ml :  $An \ R=190\text{mm}$  thing, For the comparison, other dimensions examined by the same thing with the 500 sameml biaxial-stretching-blow-molding container, i.e.,  $E=F=R=0\text{mm}$ , and the result was shown in drawing 11 . According to drawing 11 , even if there are quite many amounts of suction by reduced pressure, whenever [ reduced

pressure ] is falling and is understood that it has been hard that it comes to deform.

[0021] Drawing 12 shows the gestalt of implementation of invention of claim 5, and this biaxial-stretching-blow-molding container 1c is taken as the aggregate of two or more ribs 15 and 16 which formed intermittently the longitudinal rib 13 formed in the reduced pressure absorption panel 5 in drawing. Although what is divided into two by a diagram is shown, it is not limited to this, and you may prepare from the upper part, covering [ of 3 or circular, and a square / much ] them caudad. Other configurations and an operation are the same as that of the thing of drawing 7 thru/or the gestalt of operation of ten.

[0022] As mentioned above, although this invention was explained based on the drawing for every claim, unless it deviates from the summary of this invention, it should be understood that the mode which combined suitably these configurations or the obvious configuration in a bottle is also included by the technical range of this invention.

[0023]

[Effect of the Invention] According to the container of this invention, not to mention a mass thing, the deformation at the time of reduced pressure can be absorbed without causing a fall on the strength, even if it is small capacity, it is good-looking, and by the ability making the reduced pressure absorption panel small moreover, it becomes easy to stick a label and commodity value can be raised. Moreover, since the rigidity of a drum section improves and the thickness of a container can be fabricated thinly, the target container can be fabricated with a small quantity of an ingredient from the conventional thing.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1] It is the side elevation of the biaxial-stretching-blow-molding container in which an example of the operation gestalt of this invention is shown.

[Drawing 2] It is the side elevation which expanded a part of drawing 1 .

[Drawing 3] It is the side elevation of the biaxial-stretching-blow-molding container in which an example of the operation gestalt of this invention is shown.

[Drawing 4] It is the sectional side elevation showing a part of half-\*\*\*\*\* of drawing 4 .

[Drawing 5] It is the sectional view which meets X-X-ray of drawing 3 .

[Drawing 6] It is the property Fig. showing whenever [ reduced pressure ], the amount of suction, and relation.

[Drawing 7] It is the side elevation of the biaxial-stretching-blow-molding container in which other operation gestalten of this invention are shown.

[Drawing 8] It is the sectional side elevation showing a part of half-\*\*\*\*\* of drawing 7 .

[Drawing 9] It is the sectional view which meets the Y-Y line of drawing 7 .

[Drawing 10] It is the enlarged drawing of the wall surface part of drawing 9 .

[Drawing 11] It is the property Fig. showing whenever [ reduced pressure ], the amount of suction, and relation.

[Drawing 12] It is the side elevation of the biaxial-stretching-blow-molding container in which other operation gestalten of this invention are shown.

[Drawing 13] It is the side elevation showing the conventional example.

**[Description of Notations]**

1, 1a, 1b, 1c Biaxial-stretching-blow-molding container

2 a Peripheral wall

3 b Circular-sulcus section

4 Ten Transverse rib

5 d Reduced pressure absorption panel

5a Upper limit section

5b Lower limit section

11 e Pillar section

12 Bulge Section

13 Longitudinal Rib

14 Wall Surface

15 16 Rib

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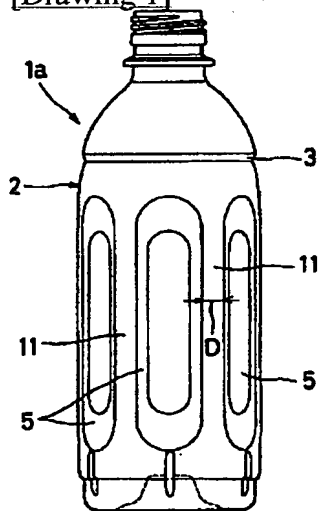
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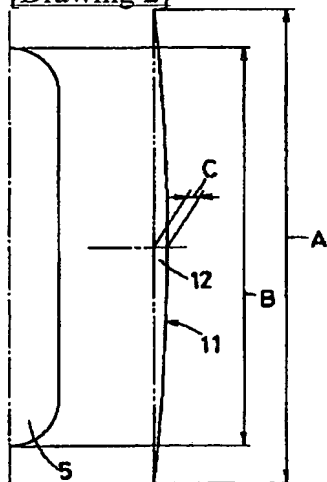
DRAWINGS

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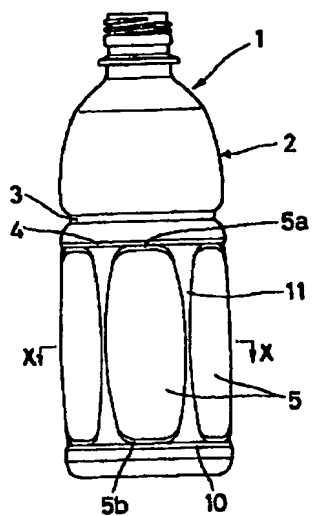
[Drawing 1]



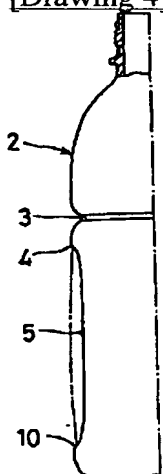
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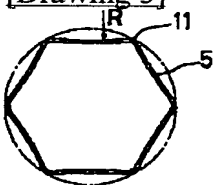
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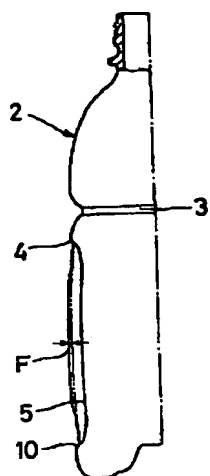
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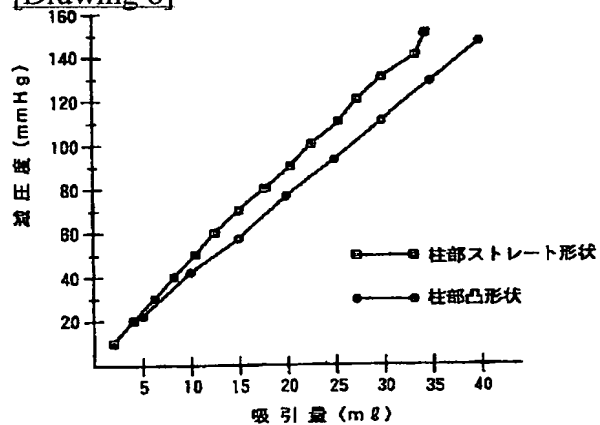
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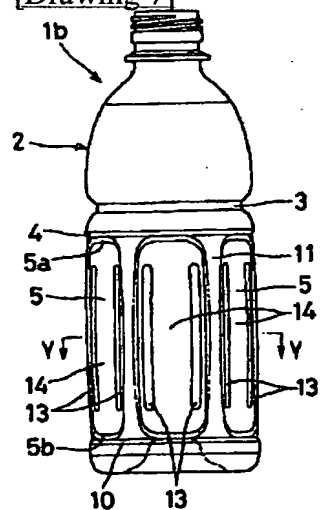
[Drawing 8]



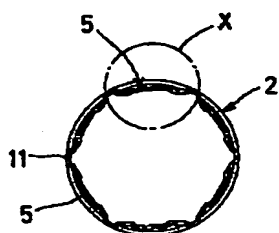
[Drawing 6]



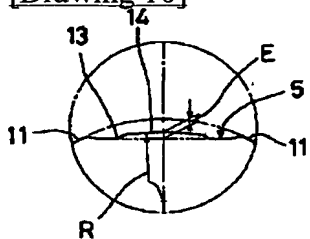
[Drawing 7]



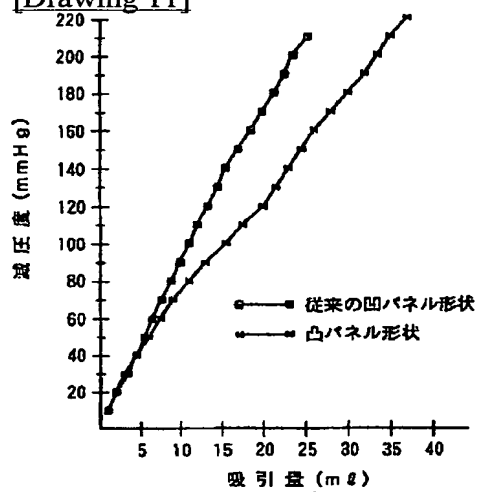
[Drawing 9]



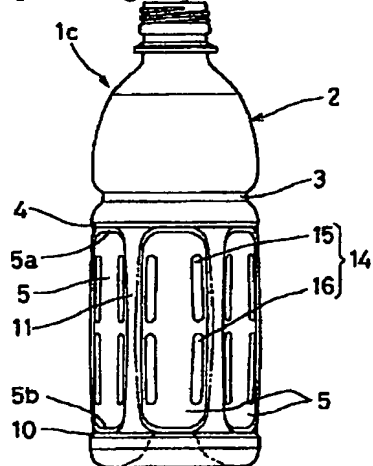
[Drawing 10]



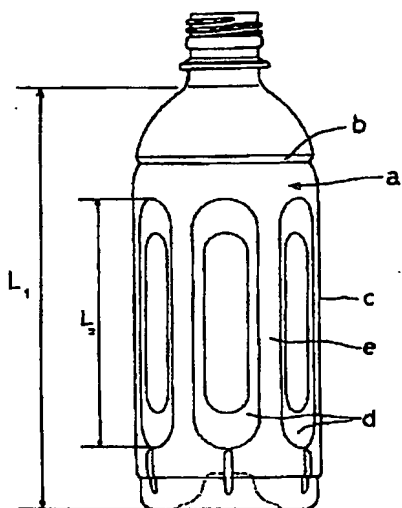
[Drawing 11]



[Drawing 12]



[Drawing 13]



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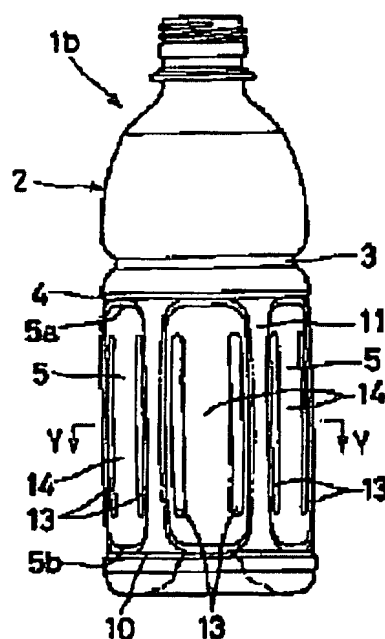
**BIAXIALLY ORIENTED BLOW-MOLDED CONTAINER**

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**Inventor:** YASUDA YOSUKE; NEMOTO YOSHINORI  
**Applicant:** TOYO SEIKAN KAISHA LTD  
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- **European:**  
**Application number:** JP19960222213 19960823  
**Priority number(s):** JP19960222213 19960823

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**Abstract of JP10058527**

**PROBLEM TO BE SOLVED:** To provide a biaxially oriented blow-molded container having an improved appearance and a reduced pressure reduction absorption panel by absorbing a deformation without lowering a strength with a small capacity. **SOLUTION:** In this biaxially oriented blow-molded container, an annular groove 3 is formed on a peripheral wall 2, a plurality of pressure reduction absorption panels 5 are provided under the groove 3, protruding or recess longitudinal ribs 13 are formed at both side ends of the panels 5, and a wall surface 14 between the ribs 13 and 13 is bulged externally. Further, upper ends 5a of the panels 5 are formed substantially adjacent to lateral ribs 4 connected under the groove 3.



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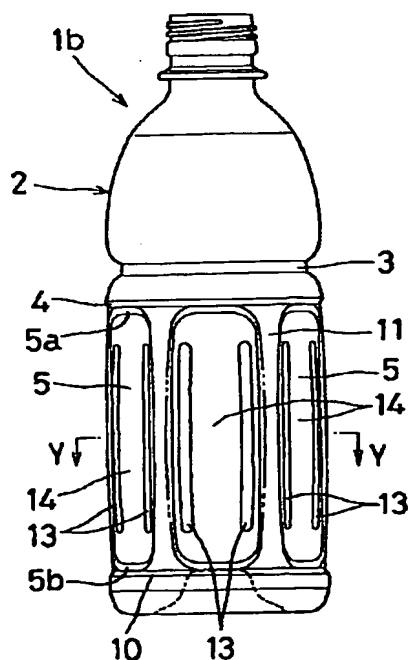
(74)代理人 弁理士 庄子 幸男

(54)【発明の名称】 二軸延伸ブロー成形容器

(57)【要約】

【課題】小容量で強度低下を起こさず変形を吸収し見栄えが良く、かつ減圧吸収パネルを小さくした二軸延伸ブロー成形容器を提供することにある。

【解決手段】周壁2に環状溝部3を形成しその下方に複数の減圧吸収パネル5を設け、この減圧吸収パネル5の両側端部に凸状あるいは凹状の縦リブ13、13を形成し、これらの縦リブ13、13間の壁面14を外方に膨出させたものであり、更に、この減圧吸収パネル5の上端部5aは、環状溝部3の下方に接続した横リブ4に実質的に隣接して形成しているものである。



## 【特許請求の範囲】

【請求項1】 周壁に環状溝部を形成しその下方に複数の減圧吸収パネルを設けた二軸延伸ブロー成形容器において、前記減圧吸収パネル間に形成した柱部を外側に突出させたことを特徴とする二軸延伸ブロー成形容器。

【請求項2】 前記柱部の突出させた部分の最外端部が、柱部の長さの2.5/1000ないし17/1000である請求項1記載の二軸延伸ブロー成形容器。

【請求項3】 周壁に環状溝部を形成した二軸延伸ブロー成形容器において、前記環状溝部の下方に横リブを接続し、該横リブの下方に形成した減圧吸収パネルの上端部が前記横リブに実質的に隣接して形成したことを特徴とする二軸延伸ブロー成形容器。

【請求項4】 周壁に環状溝部を形成しその下方に複数の減圧吸収パネルを設けた二軸延伸ブロー成形容器において、前記減圧吸収パネルに凹状あるいは凸状の縦リブを形成し、該縦リブ間の壁面を外方に突出させたことを特徴とする二軸延伸ブロー成形容器。

【請求項5】 前記減圧吸収パネル内に形成した縦リブを断続的に形成した複数のリブの集合体である請求項4記載の二軸延伸ブロー成形容器。

【請求項6】 前記減圧吸収パネルの上端部は、環状溝部の下方に接続する横リブに実質的に隣接して形成した請求項4記載の二軸延伸ブロー成形容器。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、二軸延伸ブロー成形容器に関し、より詳しくは、加熱状態の果汁、ウーロン茶等を充填した後の冷却に伴う減圧によって生じる容器の変形を、減圧吸収パネルの構造あるいは位置等を考慮して吸収するようにした二軸延伸ブロー成形容器に関する。

## 【0002】

【従来の技術】従来より、ポリエチレンテレフタレート(PET)等の熱可塑性ポリエステル製の二軸延伸ブロー成形容器は、優れた透明性や表面光沢を有し、耐衝撃性、ガスバリアー性等を有し、各種飲料用の容器として広く利用されている。この二軸延伸ブロー成形容器は、1.5ないし2リットル入りの容量の比較的大きな丸形ボトルが大半であり、その使用状況は、果汁、ウーロン茶等の各種飲料を90℃前後に加熱した後、前記ブロー成形容器に充填し、蓋をキャッピングして密封し、その後、冷却して再び常温に戻してから出荷される。この丸形ボトルは充填密封後に膨張し、その後、冷却時にボトル内が減圧になることによって収縮変形するために、図13に示すように、周壁aに環状溝部bを形成し、その下方にボトル胴部cの長さL<sub>1</sub>に対して大きな比率を占める長さL<sub>2</sub>を有する複数の減圧吸収パネルdを設けると共に、これらの間に柱部eを構成して、これら減圧吸収パネルdにより収縮変形を吸収している。また上記

飲料の充填方法としては、無菌充填法も存在するが、ウーロン茶等は充填後、容器内が減圧となる傾向があり、同様に成形容器が収縮変形を吸収している。

## 【0003】

【発明が解決しようとする課題】上記従来の二軸延伸ブロー成形容器は、1.5ないし2リットル入りの比較的大容量の丸形ボトルであるから、充填密封後の冷却時における減圧による収縮変形が、上記構成の複数の減圧吸収パネルにより吸収され、変形による外見上の見栄えにおいては特に問題がなかった。しかしながら、最近、小容量、すなわち200ないし900ml程度の小容量の二軸延伸ブロー成形容器の需要が高まり、生産量が増えると共に、加熱殺菌し膨張した後の冷却に伴う減圧による変形が目立つようになった。

【0004】この変形は、減圧吸収パネルdが凹状に変形し、特にストレート形状の柱部eが凹状に変形して見栄えが著しく低下し、しかも強度も低下するという問題を有している。これは、同じ構造の二軸延伸ブロー成形容器であっても、大容量である場合は、充填密封後の膨張した後の減圧量が相対的に少なく、現状の減圧吸収パネルdが凹状に変形することにより充分吸収できるのに対して、小容量である場合は、減圧量が相対的に大きくなり、現状の減圧吸収パネルdによっては吸収できないことによる。

【0005】そのため、胴部の剛性を向上させるために、容器の肉厚を薄くすることができないので、多くの材料を用いて容器を成形せざるを得なかった。また、この丸形ボトルが小容量になると、減圧吸収量を大きくするため、減圧吸収パネルdの軸方向の長さをボトル胴部cに対して大きくすると、丸形ボトルの胴部に内容物の表示ならびに商品価値を高めるためのラベルを貼りつけるスペースが小さくなり、不都合が生じる。

【0006】そこで、本発明の目的は、小容量であっても強度低下を起こすことなく変形を吸収できて、見栄えが良く、また、より少ない量の材料で成形を可能として、しかもその減圧吸収パネルを小さくすることによりラベル貼りのスペースを十分に確保した二軸延伸ブロー成形容器を提供することにある。

## 【0007】

【課題を解決するための手段】本発明は、上記目的を達成するために提案されたものであって、下記の構成からなることを特徴としている。すなわち、本発明によれば、周壁に環状溝部を形成しその下方に複数の減圧吸収パネルを設けた二軸延伸ブロー成形容器において、前記減圧吸収パネル間に形成した柱部を外側に突出させたことを特徴とする二軸延伸ブロー成形容器が提供される。

【0008】また、本発明によれば、前記柱部の突出させた部分の最外端部が、柱部の長さの2.5/1000ないし17/1000である上記二軸延伸ブロー成形容器が提供される。



【0009】また、本発明によれば、周壁に環状溝部を形成した二軸延伸ブロー成形容器において、前記環状溝部の下方に横リブを接続し、該横リブの下方に形成した減圧吸収パネルの上端部が前記横リブに実質的に隣接して形成したことを特徴とする二軸延伸ブロー成形容器が提供される。

【0010】また、本発明によれば、周壁に環状溝部を形成しその下方に複数の減圧吸収パネルを設けた二軸延伸ブロー成形容器において、前記減圧吸収パネルに凹状あるいは凸状の縦リブを形成し、該縦リブ間の壁面を外方に突出させたことを特徴とする二軸延伸ブロー成形容器が提供される。

【0011】また、本発明によれば、前記減圧吸収パネル内に形成した縦リブを断続的に形成した複数のリブの集合体である上記二軸延伸ブロー成形容器が提供される。

【0012】また、本発明によれば、前記減圧吸収パネルの上端部が、環状溝部の下方に接続する横リブに実質的に隣接して形成した上記二軸延伸ブロー成形容器が提供される。

【0013】

【発明の実施の形態】以下に、図面を参照して本発明の実施の形態を説明する。図1、2は請求項1、2の発明の実施の形態を示し、図において、この二軸延伸ブロー成形容器1aは、周壁2に環状溝部3を形成しその下方に複数の減圧吸収パネル5を設け、この減圧吸収パネル5間に形成した柱部11を外側に突出させ、すなわち、凸形状の突出部12を設けたものである。この突出部12の突出量は、柱部11の長さの2.5/1000ないし17/1000であることによって本発明の目的を達成し得ることが実験的に確かめられた。

【0014】次に、この突出部12による効果を確かめるために、柱部凸形状の500mmの二軸延伸ブロー成形容器1a、すなわち、環状溝部3と段部6間の柱部の長さ：A=120mm、減圧吸収パネルの長さ：B=105mm、柱部11の突出部12の突出量：C=1.0mm、柱部11の幅：D=9.0mmのものと、比較のため柱部ストレート形状の500mmの二軸延伸ブロー成形容器、すなわち、C=0mmで他の寸法は同じのものにより試験を行ない、その結果を図6に示した。図6によれば、かなり減圧による吸引量が多くても、減圧度は低下しており、変形しづらくなっているのがわかる。また、目視による観察では、柱部11に凸形状の突出部12を設けたものは、柱部11がストレートになるか僅かに凸形状になった変形なので、その変形がほとんど目立たなかった。

【0015】図3ないし5は請求項3の発明の実施の形態を示し、図において、二軸延伸ブロー成形容器1は、これの周壁2に環状溝部3を形成しこの環状溝部3の下方に横リブ4を接続し、横リブ4の下方に形成した減圧

吸収パネル5の上端部5aが横リブ4に実質的に隣接して形成したものである。図5は、図3のX-X断面を示している。

【0016】そして、減圧吸収パネル5は凹状に形成され、その間には柱部11が形成される。この減圧吸収パネル5は、その上端部5aが横リブ4に実質的に隣接されているから、結果的に横リブ4による剛性向上と、従来、密封後の冷却時に変形を生じ、柱部11の変形に影響を及ぼしていた減圧吸収パネル5の上方に形成された周壁部が存在しないため、上記冷却時に柱部11の変形が少なくなる。なお、減圧吸収パネル5の下端部5bには他の横リブ10が隣接して形成されているから、上述と同様のことが言える。

【0017】また、上述の効果により、図3に示すように、減圧吸収パネル5の軸方向の長さが短くなり、ラベルを貼る周壁2の軸方向の長さを大きく取れるため、二軸延伸ブロー成形容器1にPRのためのラベル等を貼りつけるスペースが大きく取れるようになった。

【0018】図7ないし10は請求項4、6の発明の実施の形態を示し、図において、この二軸延伸ブロー成形容器1bは、周壁2に環状溝部3を形成しその下方に複数の減圧吸収パネル5を設け、この減圧吸収パネル5の両側端部に凹状あるいは凸状の縦リブ13、13を形成し、これらの縦リブ13、13間の壁面14を外方に突出させたものであり、更に、この減圧吸収パネル5の上端部5aは、環状溝部3の下方に接続した横リブ4に実質的に隣接して形成している。

【0019】縦リブ13、13は、図では凹状のものを示しているが、凸状であっても構わない。ただし、凹状の方が縦リブ13と壁面14の接続部の肉厚が厚くなり、充填密封後の上記縦リブ13の膨張が防止され、また、減圧時の減圧吸収パネル5の壁面14と柱部の分断が確実に行われ、減圧変形時の壁面14の変形が柱部11に影響を与えず、確実に柱部11の変形を防止できる。図9は、図7のY-Y断面を示している。

【0020】次に、この縦リブ13及びこれら縦リブ13間の壁面14を外方に突出させたことによる効果を確かめるために、500mmの二軸延伸ブロー成形容器1b、すなわち、壁面14の突出量：E=0.5mm、柱部11の突出量：F=0.3mm、壁面14の曲率半径：R=190mmのものと、比較のため同じ500mmの二軸延伸ブロー成形容器、すなわち、E=F=R=0mmで他の寸法は同じのものにより試験を行ない、その結果を図11に示した。図11によれば、かなり減圧による吸引量が多くても、減圧度は低下しており、変形しづらくなっているのがわかる。

【0021】図12は請求項5の発明の実施の形態を示し、図において、この二軸延伸ブロー成形容器1cは、減圧吸収パネル5内に形成した縦リブ13を断続的に形成した複数のリブ15、16の集合体としたものであ

る。図では2本に分かれているものとしているが、これに限定されるものではなく、3本、あるいは円形、四角形のリップを多数、上方から下方にかけて設けてもよい。その他の構成、作用は図7ないし10の実施の形態のものと同様である。

【0022】以上、本発明を各請求項ごとに図面に基づいて説明したが、本発明の要旨を逸脱しない限りにおいて、これらの構成あるいはボトルにおける自明の構成を適宜組み合わせた態様も本発明の技術的範囲に包含されることは理解されるべきである。

【0023】

【発明の効果】本発明の容器によれば、大容量のものはもちろんのこと、小容量であっても強度低下を起こすことなく減圧時の変形を吸収できて、見栄えが良く、しかもその減圧吸収パネルを小さくすることが出来ることにより、ラベルを貼りやすくなり、商品価値を高めることができる。また、胴部の剛性が向上するため、容器の肉厚を薄く成形できるので、従来のものより、少ない量の材料で目的とする容器を成形することができる。

【図面の簡単な説明】

【図1】本発明の実施形態の一例を示す二軸延伸ブロー成形容器の側面図である。

【図2】図1の一部を拡大した側面図である。

【図3】本発明の実施形態の一例を示す二軸延伸ブロー成形容器の側面図である。

【図4】図4の半裁部分の一部を示す側断面図である。

【図5】図3のX-X線に沿う断面図である。

【図6】減圧度と吸引量と関係を示す特性図である。

【図7】本発明の他の実施形態を示す二軸延伸ブロー成形容器の側面図である。

【図8】図7の半裁部分の一部を示す側断面図である。

【図9】図7のY-Y線に沿う断面図である。

【図10】図9の壁面部分の拡大図である。

【図11】減圧度と吸引量と関係を示す特性図である。

10 【図12】本発明の他の実施形態を示す二軸延伸ブロー成形容器の側面図である。

【図13】従来例を示す側面図である。

【符号の説明】

|               |             |
|---------------|-------------|
| 1, 1a, 1b, 1c | 二軸延伸ブロー成形容器 |
| 2, a          | 周壁          |
| 3, b          | 環状溝部        |
| 4, 10         | 横リップ        |
| 5, d          | 減圧吸収パネル     |
| 5a            | 上端部         |
| 5b            | 下端部         |
| 11, e         | 柱部          |
| 12            | 膨出部         |
| 13            | 縦リップ        |
| 14            | 壁面          |
| 15, 16        | リップ         |

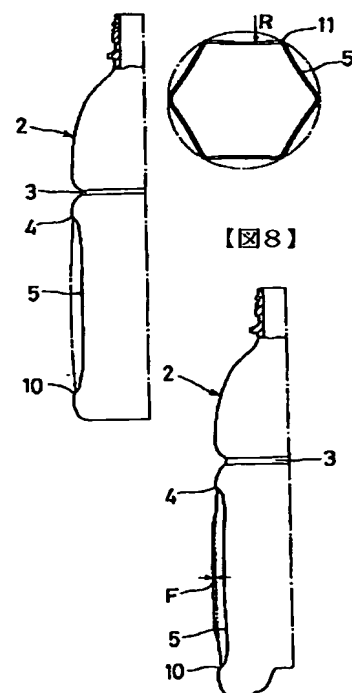
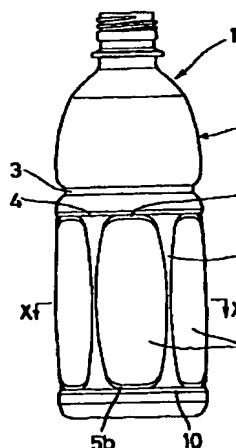
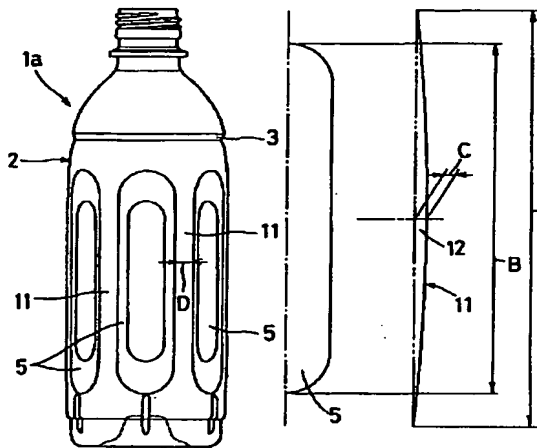
【図1】

【図2】

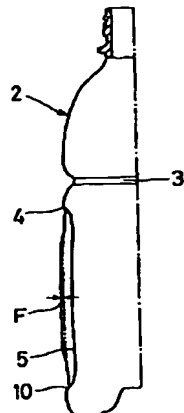
【図3】

【図4】

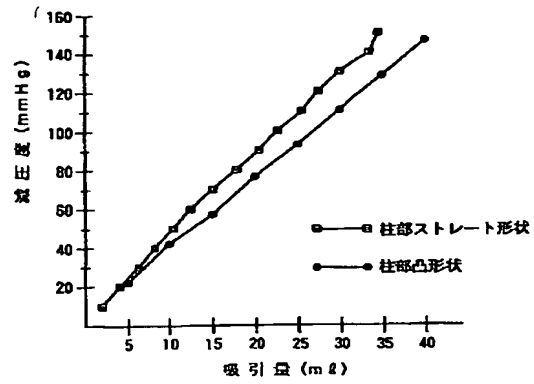
【図5】



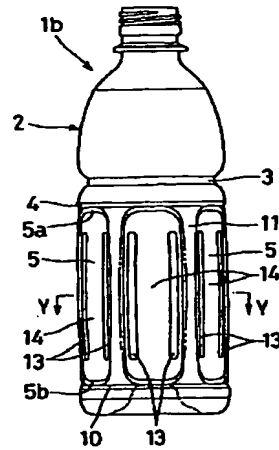
【図8】



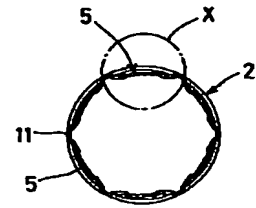
【図6】



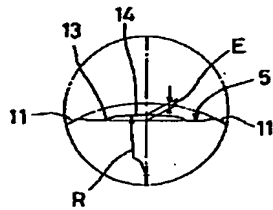
【図7】



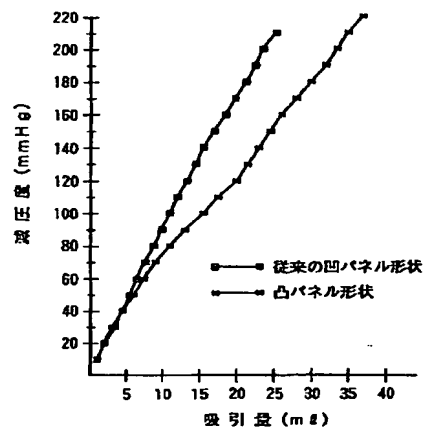
【図9】



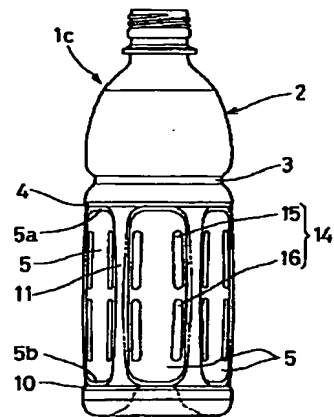
【図10】



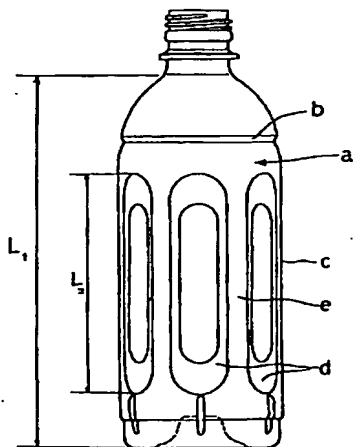
【図11】



【図12】



【図13】



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